

Claims

1. Method for monitoring, in particular for real-time monitoring of print images, comprising the following steps:
 - 5 - electro-optical detection and digitization of a real image in individual pixels,
 - use of a reference image that is segmented into a plurality of segments (9) such that the pixels exhibit approximately the same color property as the segments (9), whereby a reference value describing this color property is associated with the pixels arranged in the respective segment,
 - comparison of the color properties of the pixels of the REAL image with the corresponding reference values of the reference image, whereby given a deviation above a predetermined threshold value a corresponding pixel is marked as an error in a result image, and whereby boundary regions of the segments (9) are not considered in the comparison.
- 10 20 2. Method according to claim 1,
characterized in that
the color properties associated with the segments are grey levels and/or color values.
- 15 25 3. Method according to claim 1 or 2,
characterized in that
the pixels of the REAL image are mapped to corresponding pixels of the reference image via an affine mapping before the comparison.
- 30 4. Method according to any of the claims 1 through 3,
characterized in that

the boundary regions exhibit a width of 1 to 10 pixels and preferably of 1 to 4 pixels.

5. Method according to any of the claims 1 through 4,
characterized in that
the result image is prepared in that individual pixels or a few pixels that are contiguous and marked as errors are reset in the result image, such that these are not marked as errors in the prepared result image.

- 10 6. Method according to any of the claims 1 through 5,
characterized in that
the result image is compressed for transfer to a monitoring station.

- 15 7. Method for segmentation of a reference image for a method according to any of the claims 1 through 6, comprising the following steps:
 - provision of a digital reference image with a plurality of pixels,
 - determination of contiguous regions with approximately the same color property, whereby such a region respectively forms a segment (9),
 - association of a reference value with the pixels of a segment (9), whereby the reference value is a measurement for the color property of the respective segment (9).

- 25 8. Method according to claim 7,
characterized in that
a non-reference value is associated with the pixels at the boundary region of the segments (9), which means that these pixels are not to be compared with the pixels of the real image.

- 30 9. Method according to claim 7 or 8,

characterized in that,
in the determination of the contiguous regions with the same color
property, all pixels are selected for such a region whose color property
values lie within a certain range around the value of this color property.

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10. Method according to any of the claims 7 through 9,
characterized in that
segments that are smaller than a predetermined size and that exhibit an
adjacent segment whose color property is less removed than a
predetermined color interval from the color property of this segment is
joined with the adjacent segment, whereby a color property averaged from
the color properties of both segments is used as a color property of the
joined segment.

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15 11. Device for real-time monitoring of print images, comprising

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- a printing device (1),
- an optical scanning device (5) for scanning of the printed material,
- an evaluation device (6) that is connected with the optical scanning
device (5), whereby the evaluation device (6) comprises a computer
with a storage and a central processor [sic] unit, and
- a program for execution of a method according to one or more of
the claims 1 through 11 is stored in the storage of the evaluation
device (6) such that it can be executed.

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12. Software product for execution of a method according to one or more of the
claims 1 through 10.

30 13. Software product according to claim 12,
characterized in that
it is stored on a machine-readable data medium.